

QUARTERLY SUMMARY
OF THE
IMPROVEMENTS AND DISCOVERIES
IN THE
MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *Results of an extended Inquiry into the Quantity of Carbonic Acid evolved from the Lungs under the Influence of various Agents.*—Dr. EDWARD SMITH, in a communication to the Section of Physiology of the British Association for the Advancement of Science, stated that he had conducted a series of experiments extending over several months, and found, by his new instrument, that the quantity of carbonic acid expired varied most materially under the influence of different kinds of food, different states of the atmosphere, etc. The paper went into an inquiry—first, as to the quantity of carbonic acid expired in twenty-four hours, with the variations hour by hour; second, the influence of season; and third, the influence of nearly all ordinary articles of food and of a few medicines. During the summer, respiration is always feeble, as compared with the colder months of the year; and although the skin exercised most important functions, he found that it was not vicarious for the lungs in the expiration of carbonic acid; for while the lungs expired 600 grains, the skin threw off only six grains. The increase in the quantity of carbonic acid was greater and more enduring after eating oatmeal and rice than after partaking of arrowroot; whilst wheat produced the greatest quantity, though the increase was less enduring than with oatmeal and rice. Tea, coffee, and cocoa were found to be respiratory excitors, and consequently increased the waste of the system; they could not be classed as food; but as tea induced perspiration, it was most valuable as a remedy against the action of heat. Tea caused the evolution of much more carbon than it supplied. Tea would also be useful in cases of drowning and interrupted pulsation. Brandy, sometimes administered in cases of drowning, had the very opposite effect to that desired, being a non-excitator of pulsation; whereas tea increased the action of the lungs and skin. If the object were to prevent the waste of the system, then alcohol might be useful, and tea would be improper; but if they wished to refresh themselves, tea should be taken. The experiments made showed that those who were more susceptible of injurious influence by heat were the least able to bear any change of climate; and if this were borne in mind, it would be found of service to those who might contemplate going abroad—to the East or elsewhere.—*British Medical Journal*, Oct. 23, 1858.

2. *Experiments on Digestion.*—Dr. GEO. HARLEY read a communication on this subject before the Section of Physiology of the British Association for the Advancement of Science, at its late meeting in Leeds.

The communication was illustrated by numerous experiments showing the properties of the saliva, the gastric juice, the bile, and the pancreatic secretion. The author stated that, contrary to an opinion lately published by Bernard, he had found that the human saliva contains both sulphocyanide of potassium and

iron. The latter substance, however, can only be detected after the organic matters contained in the secretion are destroyed by burning. Dr. Harley had ascertained that a person of nine stone secreted between one and two pounds of saliva in twenty-four hours. The gastric juice, the author said, does not destroy the power possessed by the saliva of transforming starch into sugar; consequently, the digestion of amylaceous food is continued in the stomach. The gastric juice has the property of changing cane into grape sugar. The author made some remarks upon the cause of the gastric juice not digesting the living stomach; and said that his experiments showed that it is not the epithelium lining the organ which prevents its being digested, but the layer of thick mucus which covers its walls. When the latter substance is absent, the gastric juice attacks the walls of the living stomach, and digests them, causing perforation and death. As regards the bile, it seems that this secretion takes an active part in rendering the fatty matters of our food capable of being absorbed into the system. The most curious of all the digestive fluids, however, is the pancreatic secretion, for it unites in itself the properties of all the others. It not only transforms starch and other such substances into sugar, but it emulsionizes fats, and even digests protein compounds. As a remedy in indigestion, pancreatin should be greatly superior to pepsine, which can only digest one kind of food, namely, protein. The author said he had been labouring to obtain pancreatin in a perfectly pure state, and had been to a certain degree successful. With pancreatin, we should be able to digest any kind of food we pleased; and, therefore, the obtaining of it in a state of purity would prove an invaluable boon to suffering humanity.—*British Med. Journ.*, Oct. 16, 1858.

3. On the Form of the Eyeball, and the Relative Position of the Entrance of the Optic Nerve in different Animals.—Mr. THOS. NUNNELEY read an interesting paper on these subjects before the British Association for the Advancement of Science, at its recent meeting at Leeds.

It was well known, he observed, that the orbits are much larger than the eyeballs, and that their axes diverge considerably in an outward direction, while those of the two eyes are perfectly parallel. The eyeballs lie in the fore-part of the orbits, and, according as they are more or less prominent, and more or less covered with the lids, do they appear to be larger or smaller. The eye of the infant is larger, in proportion to the size of the body, than that of the adult; but it is by no means certain that the eye of the male is larger, proportionately to the size of the body, than the eye of the female. By some anatomists, the human eye was described as a spheroid, the diameter of which, from before to behind, is greater than in any other direction. He had measured a great number of eyes, of the human subject as well as of animals, and he found that wherever there was a departure from the spherical figure, it was in a direction contrary to that which had been commonly stated. In some instances, the difference between the two diameters was scarcely perceptible; in all where a distinction was observed, the transverse was the greatest. He had prepared a set of tables, which were printed, containing the result of the measurement of two hundred eyes of various creatures. The measurements, he thought, clearly proved that, whatever part the fibres of the optic nerve play in the phenomena of vision, the greatest number of them are distributed on that part of the eyeball where there is the greatest range of vision, and that the greatest expanse of retina is on that part of the ball opposite to where objects are placed, and, consequently, it is where the visual image of them must fall. That this was a fact, a careful comparison of the position of the eyes in the head, the size of the eyeball, and the exact position of the entrance of the nerve into it, with the mode of life and habits of various creatures would render obvious. Man, from the erect position of his body, the horizontal placing of his eyes, and his habits, has a more panoptic range than any other creatures (of course, in this consideration, all motions of the head, neck, and body of the animal must be excluded, and those of the eyeballs alone admitted). In him, the optic nerve enters the ball not far from the centre, leaving, however, a somewhat shorter space on the inner and lower parts of the retina than on the upper and outer. Now, while man enjoys a free range of vision above the horizontal line, there are far more occasions for him to look